

Message Text

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ACTION DLOS-09

INFO OCT-01 IO-14 ISO-00 ACDA-12 AGRE-00 AID-05 CEA-01

CEQ-01 CG-00 CIAE-00 COME-00 DODE-00 DOTE-00

EB-08 EPA-04 SOE-02 DOE-15 FMC-02 TRSE-00 H-02

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OES-07 OMB-01 PA-02 PM-05 SP-02 SS-15 ICA-20

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R 011902Z MAY 78

FM USMISSION GENEVA

TO SECSTATE WASHDC 9078

UNCLAS SECTION 01 OF 03 GENEVA 06599

PASS TO DOI ASSISTANT SECRETARY DAVENPORT AND GEOLOGICAL
SURVEY DIRECTOR MENARD.

E.O. 11652: N/A

TAGS: PLOS

SUBJECT: LOS: SEMINAR ON PRACTICAL ASPECTS OF THE
EXPLORATION OF THE SEABED

1. AN EVENING SEMINAR WAS ORGANIZED ON APRIL 27
BY NEGOTIATING GROUP ONE IN RESPONSE TO A REQUEST
FROM GABON THAT INDUSTRIALIZED COUNTRIES PROVIDE
INFORMATION ON THE RESULTS OF OCEAN MINERAL RESOURCE
INVESTIGATIONS DURING LAST DECADE. THE MEETING WAS
ATTENDED BY MORE THAN 200 LEAVING STANDING ROOM ONLY.
THE PRINCIPAL SPEAKERS WERE DR. VINCENT MCKELVEY (US)
(ON DISTRIBUTION OF MANGANESE NODULES ON THE DEEP
OCEAN FLOOR) AND MR. BASTIEN-THIRY OF FRANCE (ON
CHARACTERISTICS OF THREE SYSTEMS FOR MINING NODULES),
SUPPLEMENTED BY A MOVIE SHOWING FRENCH TESTS ON
DREDGE DESIGN. CHAIRMAN INVITED ARCHER (UK) AND
MR. PASHO (CANADA) TO MAKE SUPPLEMENTARY REMARKS
AND THEY JOINED THE PANEL IN ANSWERING QUESTIONS.
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NJENGA WAS PLEASED WITH THE SESSION AND ANNOUNCED
HE MIGHT HAVE ANOTHER ONE. THE SESSION WAS USEFUL
IN INFORMING DELEGATES OF THE PROGRESS AND PROBLEMS
IN SEABED RESOURCE EXPLORATION AND DEVELOPMENT AND
IN MAKING THE G-77 AWARE OF ENORMOUS AMOUNT OF
INFORMATION THAT HAS BEEN PUBLISHED IN RECENT YEARS.

2. THE TEXT OF MCKELVEY'S STATEMENT FOLLOWS.

BEGIN TEXT:

WE ARE GLAD TO RESPOND TO THE NEGOTIATING GROUP'S REQUEST FOR A SYNOPSIS OF WHAT HAS BEEN LEARNED ABOUT THE DISTRIBUTION OF MANGANESE NODULES AS THE RESULT OF SCIENTIFIC STUDIES IN RECENT YEARS. I WILL SPEAK MAINLY WITH RESPECT TO MAPS THAT HAVE BEEN RECENTLY PUBLISHED IN THE UNITED STATES AND THAT ARE AVAILABLE TO DELEGATES HERE AT THE CONFERENCE.

LET ME DRAW ATTENTION, HOWEVER, TO THE FACT THAT MUCH ADDITIONAL INFORMATION HAS ALREADY BEEN PUBLISHED AS THE RESULT OF SEVERAL RESEARCH PROGRAMS -- AMONG THEM THE INTERNATIONAL DECADE OF OCEAN EXPLORATION, AN INTERNATIONAL COOPERATIVE PROGRAM GENERATED BY THE SEABEDS COMMITTEE; CRUISES BY RESEARCH VESSELS OF THE SOVIET UNION, FEDERAL REPUBLIC OF GERMANY, FRANCE AND THE UNITED STATES; AND THE U.S. DEEP OCEAN MINING ENVIRONMENTAL STUDY. I HAVE HERE SOME OF THE PUBLICATIONS OF THESE AND OTHER PROJECTS, WHICH WE WOULD BE GLAD TO SHOW TO ANYONE WHO MAY BE INTERESTED. A LIST OF ALL THE REPORTS AND MAPS RELATED TO DEEP SEA RESOURCES AND MINING PUBLISHED DURING THE LAST 10 YEARS WOULD RUN TO MANY HUNDREDS OF DOCUMENTS.

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TURNING NOW TO THE MAPS, MAY I DESCRIBE FIRST THE WORLD MAP JUST PUBLISHED BY THE LAMONT-DOHERTY GEOLOGICAL OBSERVATORY AT COLUMBIA SHOWING THE DISTRIBUTION, GRADE, AND CONCENTRATION ON THE SEAFLOOR OF MANGANESE NODULES. THIS MAP IS ONE TO BE READ WITH A MAGNIFYING GLASS, FOR IT SHOWS BY SYMBOLS A GREAT VARIETY OF INFORMATION, INCLUDING GEOLOGIC FEATURES, SUCH AS FRACTURE ZONES AND THE KIND OF SEDIMENT OR ROCK THAT LIES ON THE SURFACE OF THE SEA BOTTOM. IT SHOWS THE AREAS IN WHICH NODULES HAVE BEEN FOUND, THE LOCATION WHERE NODULES HAVE BEEN SAMPLED, THE LOCATION OF BOTTOM PHOTOGRAPHS, AND, BY INGENIOUS SYMBOLS, THE AVERAGE CONTENT OF IRON, MANGANESE, NICKEL, COPPER, AND COBALT IN LOCAL GROUPS OF SAMPLES.

WHEN YOU EXAMINE THIS MAP IN DETAIL YOU WILL BE STRUCK, I THINK, BY THE ENORMOUS AMOUNT OF INFORMATION THAT HAS BEEN ASSEMBLED. BUT, WHEN LOOKING AT THE DISTRIBUTION OF DATA POINTS, YOU WILL ALSO BE STRUCK BY THEIR OVERALL PAUCITY, AND THE GREAT DISTANCES --

SCORES OR EVEN HUNDREDS OF KILOMETERS IN MANY PLACES -- THAT SEPARATE THEM. MUCH HAS BEEN LEARNED BUT MUCH STILL REMAINS TO BE LEARNED ABOUT THE DISTRIBUTION AND CHARACTER OF MANGANESE NODULES AND OTHER GEOLOGICAL FEATURES OF THE OCEAN BASINS.

NEVERTHELESS, SEVERAL IMPORTANT CONCLUSIONS CAN BE DRAWN FROM WHAT IS SHOWN HERE. MANGANESE NODULES ARE WIDELY DISTRIBUTED IN THE PACIFIC, INDIAN AND ATLANTIC OCEANS. THE PACIFIC OCEAN CONTAINS MANY LOCALITIES, ESPECIALLY IN THE NORTH EQUATORIAL PACIFIC BUT ALSO IN THE SDUTH PACIFIC, WHERE NODULES CONTAIN RELATIVELY HIGH CONCENTRATIONS OF MANGANESE, NICKEL, COOPER AND COBALT. THE INDIAN OCEAN ALSO CONTAINS UNCLASSIFIED

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PASS TO DOI ASSISTANT SECRETARY DAVENPORT AND GEOLOGICAL
SURVEY DIRECTOR MENARD

LOCALITIES WHERE HIGH CONCENTRATIONS EXIST BUT THE
METAL CONTENT OF MOST SAMPLES IS LOWER THAN THAT OF
THE BETTER PACIFIC SAMPLES. ALTHOUGH NODULES ARE
KNOWN IN THE ATLANTIC, NONE OF THOSE ANALYZED WOULD

APPEAR TO BE OF PRESENT COMMERCIAL INTEREST.

WHILE THERE ARE THUS MANY INDICATIONS OF THE EXISTENCE OF NODULES RICH IN POTENTIALLY RECOVERABLE METALS, IT IS NOT KNOWN YET WHETHER ANY OF THESE INDICATIONS DO, IN FACT, REPRESENT A DEPOSIT THAT CAN BE MINED PROFITABLY.

JUDGED FROM PUBLICLY AVAILABLE INFORMATION, HOWEVER, AND FROM THE INFORMATION RELEASED BY THE SEVERAL CONSORTIA THAT HAVE BEEN ACTIVE IN THE DEVELOPMENT OF DEEP SEA MINING TECHNOLOGY, THE AREA OF GREATEST PRESENT INTEREST LIES IN THE NORTH EQUATORIAL PACIFIC IN A BELT THAT LIES IN THE VICINITY OF THE CLARION AND THE CLIPPERTON FRACTURE ZONES AND UNCLASSIFIED

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THAT EXTENDS APPROXIMATELY FROM THE LONGITUDE OF HAWAII EASTWARD NEARLY TO THE LONGITUDE OF BAJA CALIFORNIA.

FOR THIS AREA, THE SCIENTISTS OF THE LAMONT-DOHERTY OBSERVATORY ALSO RECENTLY COMPILED A MAP SHOWING THE CONFIGURATION OF THE OCEAN BOTTOM AND THE SHIP TRAVERSES FROM WHICH THE DATA WERE OBTAINED, AND THEN FOR THE SAME AREA BUT AT MUCH LARGER SCALE THEY PREPARED 15 MAPS TO WHICH WERE ADDED THE DATA AVAILABLE IN THE DATA BANK OF THE SCRIPPS INSTITUTION OF OCEANOGRAPHY ON THE DISTRIBUTION AND QUALITY OF SAMPLES OF MANGANESE NODULES. COPIES OF THE SMALL SCALE MAP ARE AVAILABLE HERE FOR ALL DELEGATIONS AND COPIES OF THE OTHERS WILL BE MADE AVAILABLE TO ANY DELEGATION THAT WISHES THEM.

WHEN THESE MAPS CAME OFF THE PRESS A FEW WEEKS AGO, I FOUND IN EXAMINING THEM THAT IT IS POSSIBLE TO DELINEATE A CENTRAL AREA BETWEEN THE CLARION AND CLIPPERTON FRACTURE ZONES IN WHICH THE COMBINED NICKEL AND COPPER CONTENT OF THE NODULES EXCEEDS A CUT-OFF GRADE OF MORE THAN 1.8 PERCENT. THIS AREA AVERAGES NEARLY 600 KM IN WIDTH AND 4200 KM IN LENGTH, AND IS APPROXIMATELY 2.3 MILLION SQUARE KILOMETERS IN SIZE. WITHIN IT THERE ARE ABOUT 600 DATA POINTS (OR 1 PER 3800 SQUARE KILOMETERS), OF WHICH 70 (OR 1 PER 33,000 SQUARE KILOMETERS) INCLUDE INFORMATION ON BOTH METAL CONTENT AND CONCENTRATION, EXPRESSED IN KILOGRAMS PER SQUARE METER. OF THE 600 POINTS OF OBSERVATION, ABOUT ONE FOURTH SHOW THAT FEW OR NO NODULES ARE PRESENT ON THE BOTTOM. THERE ARE A FEW POINTS ALSO WITHIN THE AREA WHERE THE METAL CONTENT FALLS BELOW 1.8 PERCENT COMBINED NICKEL AND COPPER BUT THESE WERE

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INCLUDED ONLY WHERE THE AVERAGE WITH ADJACENT SAMPLES WAS ABOVE 1.8 PERCENT. IT IS NOT SURPRISING, INCIDENTALLY, TO FIND LOWER GRADE NODULES ASSOCIATED WITH RICHER ONES -- EVEN IN THE SAME DREDGE HAULS, THE GRADE OF INDIVIDUAL NODULES MAY VARY CONSIDERABLY.

THESE ARE SPARSE DATA, BUT THEY SUGGEST THAT A LARGE AREA BETWEEN THE CLARION AND CLIPPERTON FRACTURE ZONES CONTAINS NODULES RELATIVELY HIGH IN NICKEL AND COOPER. THE 70 SAMPLES I MENTIONED AVERAGE 2.4 PERCENT COMBINED COPPER AND NICKEL WITH AN AVERAGE CONCENTRATION OF 9.25 KILOGRAMS PER SQUARE METER -- BOTH VALUES BEING A LITTLE LOWER THAN CONSIDERED ADEQUATE FOR MINING BY SOME. WE DO NOT YET HAVE THE AVERAGE GRADE AND CONCENTRATION FOR ALL SAMPLES AVAILABLE, BUT ASSUMING THE AVERAGES ARE CLOSE TO THESE VALUES, WHAT SORT OF PROSPECTS DO THEY SUGGEST?

AT THIS POINT, NO FIRM ANSWER CAN BE GIVEN TO THIS QUESTION. WHATEVER IS SAID MUST BE LABELED AS SPECULATION. BUT THE DATA DO ALLOW US TO INDICATE A RANGE OF POSSIBILITIES. FOR EXAMPLE, IF WE ASSUME THAT 50 PERCENT OF THE AREA HAS MINABLE NODULES AND 20 PERCENT OF THOSE WITHIN THE MINABLE AREA ARE RECOVERABLE -- ASSUMPTIONS THAT APPEAR TO BE REASONABLE -- THEN A TOTAL OF ABOUT 1.5 BILLION TONS OF NODULES WOULD BE RECOVERABLE -- ENOUGH TO SUPPORT ABOUT 20 MINING OPERATIONS EACH PRODUCING AN AVERAGE OF ABOUT 75 MILLION TONS OVER THEIR LIFETIMES. ALTERNATIVELY, IF ONLY 25 PERCENT OF THE AREA IS MINABLE, THE NUMBER OF SUCH OPERATIONS WOULD BE CUT IN HALF; OR IF 75 PERCENT WERE MINABLE, THE NUMBER WOULD BE INCREASED BY HALF. IF, AS WE MIGHT EXPECT TO RESULT FROM ADVANCING TECHNOLOGY, THE PERCENTAGE OF NODULES RECOVERED IS INCREASED, THE RECOVERABLE TONNAGE AND THE NUMBER OF OPERATIONS IT WOULD SUPPORT

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WOULD INCREASE STILL FURTHER. FOR ANY ONE OF A VARIETY OF REASONS IT MAY TURN OUT THAT NODULES FROM THIS ZONE

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ARE NOT PRODUCIBLE AT ALL, AT LEAST FOR SOME YEARS TO
COME. AT THE OTHER END OF THE RANGE OF POSSIBILITIES,
IT IS CONCEIVABLE THAT, WITH ADVANCE IN RECOVERY
TECHNOLOGY AND A LOT OF LUCK IN WHAT TURNS OUT TO BE
THE ACTUAL CONCENTRATION OF NODULES, THIS AREA MIGHT
CONTAIN ENOUGH NODULES TO SUPPORT 50 OR 60 OF THE
ASSUMED AVERAGE SIZED OPERATIONS I MENTIONED. IT SEEMS
CLEAR, HOWEVER, THAT THIS MOST PROMISING AREA PRESENTLY
KNOWN CONTAINS POTENTIAL RESOURCES ADEQUATE TO SUPPORT
TENS OF OPERATIONS AT MOST AND NOT HUNDREDS.

IN CLOSING, LET ME GIVE SOME PERSPECTIVE TO WHAT
WE KNOW ABOUT THE DISTRIBUTION OF PROSPECTIVELY VALUABLE
DEPOSITS OF MANGANESE NODULES. WE KNOW OF ONE LARGE
AREA -- BETWEEN THE CLARION AND CLIPPERTON FRACTURE
ZONES IN THE NORTH EQUATORIAL PACIFIC -- WHERE THERE
APPEAR TO BE EXTENSIVE ACCUMULATIONS OF PROMISING
DEPOSITS -- CLEARLY NOT OF UNLIMITED DIMENSIONS, BUT
EXTENSIVE ENOUGH TO ATTRACT THE COMMERCIAL INTEREST
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THE AREA HAS INDEED BEEN RECEIVING. BEYOND THIS ARE
OTHER AREAS WHERE THERE ARE INDICATIONS OF HIGH GRADE
DEPOSITS, ENOUGH TO SUGGEST THE POSSIBILITY THAT

ADDITIONAL SEARCH MAY TURN UP OTHER PROMISING AREAS.
AND THERE IS THE PROSPECT THAT, IF THE INDUSTRY IS
ABLE TO GET UNDERWAY AND IMPROVE ITS RECOVERY
TECHNOLOGY, DEPOSITS TOO LOW GRADE TO BE CONSIDERED
FOR MINING NOW WILL BECOME MINABLE IN THE MORE
DISTANT FUTURE. BUT IT WILL TAKE EXTENSIVE AND
COSTLY EXPLORATION AND TECHNOLOGIC DEVELOPMENT
TO TEST, MUCH LESS REALIZE, ANY OF THESE POSSIBILITIES.

END TEXT. RICHARDSON

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